

Assistantship Description: Two PhD positions are available with Dr. Tao Liu at Michigan Technological University. The student will use machine learning\deep learning methods with remote sensing data to solve problems relevant to climate change. Specifically, the student will choose one of the following three areas:

1. Phenotyping Individual Trees with Drone and Handheld Remote Sensing Systems
 - Utilize LiDAR data to precisely map the individual trees in natural forests.
 - Employ LiDAR data for detailed analysis of morphological traits at the individual tree level, including measurements of height, stem form, diameter at breast height (DBH), and leaf characteristics such as leaf area index (LAI), leaf area density (LAD), color, distribution, and angle, along with canopy features like volume, coverage, structure, and phenological aspects (e.g., flowering periods, leaf coloration timing, leaf expansion, and leaf fall).
 - Process optical remote sensing data to assess biochemical traits, including chlorophyll and lignin content, and water use efficiency at the individual tree level.
2. Forest Health Mapping and Understanding Mechanisms
 - Utilize aerial and satellite remote sensing platforms combined with deep learning techniques to conduct large-scale forest health mapping at the national level.
 - Employ AI technologies for predicting forest health trends.
 - Investigate the influence of various factors on forest health, particularly the role of climate change, using AI technologies.
3. Wildfire Mapping and Forecasting
 - Integrate Sentinel and Landsat imagery to accurately identify the ignition points of wildfires.
 - Use the Pytorch forecasting package, integrating multiple data types, to predict wildfire probabilities.

Qualifications:

- U.S. citizens, nationals and permanent residents
- MS or BS degree in environmental science, forestry, geography, computer science, data science or other related fields.
- Programming skills using Python.
- Remote sensing research or image processing experience
- Strong communication skills, both in terms of formal written reports/manuscripts and oral presentations.

Funding: The selected candidate will be funded with NSF Research Traineeship program.

Timing: The start date is Fall 2024. Please send your materials by April 1st 2024. The position is available immediately and open until filled.

Application Procedure:

Applicant should email Dr. Tao Liu at taoliu@mtu.edu to express your interest in the position. Please include a brief cover letter describing your relevant qualifications and interest in the project.

MTU Description:

Michigan Tech is located in Houghton, MI in the heart of Michigan's Upper Peninsula. Houghton is situated on the hills bordering the beautiful Portage Waterway and is only minutes from the Lake Superior shoreline. The area offers a bounty of cultural and recreational opportunities and a low cost of living. Houghton was rated as the 15th Greatest Place to Live in America by Outside

Magazine in 2014. This environment combined with a great research opportunity results in an excellent quality of life.

===== << Tao Liu, Ph.D. >> =====

Assistant Professor in Remote Sensing and GIS
College of Forest Resources and Environmental Science
Michigan Technological University
Office number: +1(906) 487-1720
Email: taoliu@mtu.edu
Noblet Building 169
1400 Townsend Drive
Houghton, MI 49931